

*Op. cit.* p. 214.

3 ♂.

Out of the 49 species of birds procured, 33 (marked with an asterisk) are strictly confined, so far as the Peninsula is concerned, to the zone above 3,000 feet, while three (marked with a dagger) are of only accidental occurrence below that limit. Of the remainder, six may be classed as submontane while only seven are generally met with at low elevations.

Compared with the list of 86 species from the hills of Negri Sembilan (*antea*, p. 219) it will be observed that only ten species—*viz.*:

Macropygia ruficeps	Calyptomena viridis
Nyctiornis amieta	Abornis schwaneri
Chotorhea mystacophanes	Hemixus cinereus
Pyrhopicus porphyromelas	Stachyris davisoni
Chrysophlegma humei	Cittocinclia macrura

are common to both lists, while of these 10 species, seven are low-land species, three are submontane and none are high elevation forms.

It is, therefore, I think, fairly evident that at some comparatively recent time a barrier has existed between the mountains of Southern Selangor and their continuation in Negri Sembilan, sufficient to prevent the extension of the dominant continental and Sumatran form southwards. It is evident, also, that this barrier must have been a substantial one, as wide stretches of low country separating the Gunong Tahan Ranges from the backbone of the Peninsula have not sufficed to effect any specific differentiation in the fauna of the two ranges.

Such evidence as is afforded by the small number of mammals found at high elevations also bears out the same contention.

## ON NEW MAMMALS FROM THE MALAY PENINSULA AND ADJACENT ISLANDS.

BY HERBERT C. ROBINSON, C.M.Z.S., AND C. BODEN KLOSS, F.Z.S.

1. HIPPOSIDEROS RIDLEYI, *sp. nov.*

**TYPE.**—Adult male in spirit with extracted skull. No. 2068 11, Selangor Museum. Collected in the Botanic Gardens, Singapore, by H. N. Ridley, Esq., in June, 1911.

**CHARACTERS.**—A saucer-shaped disc in front of the nostrils above the horizontal nose leaf. No supplementary nose leaves on the sides of muzzle.

**COLOUR.**—Dried from spirit. Hairs of pelage about 10 mm. in length, the tips dark-brown, the bases dull brownish-white for two-thirds the length. Fur extending on to the wing membranes, above and below, for about 7 mm. from the sides of the body. Membranes, sooty-brown to black, inferior edge of the antebrachium narrowly edged with dull yellow.

**NOSE-LEAF.**—Anterior horizontal nose-leaf covering the end of the muzzle, slightly emarginate at the front and at the sides, sinuous in section, broadest posteriorly. Nostrils surrounded by laminae; in front of and between the nostrils a concave circular disc connected with the front of the leaf and the base of the sella by low ridges of membrane. Sella broadly cordiform, narrower than the nose leaves, with slight wart-like prominences along its upper edge, the centre slightly projecting, the base with a faintly bisected concavity. Hinder-nose-leaf with rounded margin, the front surface concave and divided vertically into four cells; posterior surface with a broad projecting fold of skin.

A broad frontal glandular sac, situated between two warty prominences.

**EARS.**—Ears broad, the tips rectangular, outer margin very slightly concave below the tips, then slightly convex, the outer edges strongly folded near the base; extending to the end of muzzle when laid forward and connected by a low ridge of skin.

**WINGS AND MEMBRANES.**—Wings from the tarsus; interfemoral membrane concave between the extremities of the calcanea, extreme tip of tail free.

**SKULL AND TEETH.**—Skull most nearly resembles that of *H. bicolor* but is more elongate, the zygomata relatively narrower, the sagittal crest less developed and the nasal swellings more dilated. P<sup>2</sup> is more developed and is situated well within the tooth-row: it is relatively much larger than the same tooth in *H. galeritus*.

**MEASUREMENTS** (from spirit specimen).—Head and body, 49; tail, 24; hind-foot, 7.8; tibia, 19.5; fore-arm, 47.2; third metacarpal, 34; fourth metacarpal, 35.4; fifth metacarpal, 35 mm.

Breadth of posterior nose leaf, 9.0; breadth of sella, 7.8; breadth of horizontal nose leaf, posteriorly, 8.2; anteriorly, 4.3; height of posterior nose leaf from crown, 2.75; height of sella from base, 3.7; greatest length of horizontal nose leaf, 6.75; diameter of nasal disc, 3.0. Length of ear, 22; breadth, 17 mm. Cranial measurements: total length, 19.7; mastoid width, 10.8; width of brain-case, 8.8; zygomatic width, 9.6; maxillar width, 6.8; anteorbital width, 6.1; width across cingula of canines, 4.3; length of upper tooth-row, including canine, 6.8 mm.

**SPECIMENS EXAMINED.**—One (the type).

**REMARKS.**—The nasal disc separates this species from all others of the genus though the absence of supplementary leaves on the muzzle allies it to *H. bicolor* and *H. dorius*.

TUPAIA FERRUGINEA PENANGENSIS, *subsp. nov.*

**TYPE.**—Adult male (skin and skull). No. 1445/11, Selangor Museum.

Collected at Telok Bahang, Penang Island, on the 2nd April, 1911, by E. Seimund.

CHARACTERS.—Smaller than *T. ferruginea ferruginea* and duller and paler above; differs from *T. f. wilkinsoni* and other northern races in having the ferruginous tint of the back extending on to the shoulders.

COLOUR.—Upper-surface grizzled black and ferruginous, somewhat olivaceous on the head and nape. Shoulder stripes, well marked, yellowish buff. Under-surface yellowish buff, brightest on the throat. The hairs of the centre of the abdomen and the limbs with greyish bases.

Tail above, distinctly darker than the back, annulated towards the base with black and whitish buff, the tips of the hairs glistening yellow; below, the whitish annulations in excess, the vertebrae clad with short black and grey hairs.

Feet, blackish brown, speckled with yellow buff.

MEASUREMENTS.—Collector's external measurements taken in the flesh: head and body, 173; tail, 165; hind-foot, 42; ear, 16 mm.

Cranial measurements: greatest length, 50.1; basilar length, 43.5; palatilar length, 26.9; palatal breadth, 8.2; zygomatic breadth, 23.8; interorbital breadth, 12.9; cranial breadth, 19.0; breadth of rostrum at diastema, 6.8; length of rostrum at lachrymal notch, 21.3; upper molar series, 15.9 mm.

SPECIMENS EXAMINED.—Twenty, all from the type locality.

REMARKS.—This race is more closely associated with the Singapore and Southern Peninsular form than those occurring on the islands and mainland to the north, from which it differs principally in colouration.

CROCIDURA MALAYANA, *sp. nov.*

TYPE.—Adult female (skin and skull), No. 180111, Selangor Museum. Collected on Maxwell's Hill, near Taiping, Perak, 3,500 feet, on 25th April, 1910, by E. Seimund.

CHARACTERS.—Intermediate in size between *Crocidura fuliginosa* and *C. major*\* and darker than either.

COLOUR.—Dark rusty iron-grey throughout, the base of the tin grey. Feet, hands and tail very thinly clad with sooty hairs, the basal half of the latter furnished with a few scattered long white hairs.

SKULL AND TEETH.—Do not differ in characters from those of the above-mentioned races.

MEASUREMENTS.—Collector's external measurements, taken in the flesh: head and body, 80; tail, 57; hind-foot, 13; ear, 11 mm.

Cranial measurements of the type; † greatest length (excluding incisors), 21.8; basal length, 19.5; palatal length, 9.9; lachrymal breadth of rostrum, 4.4; greatest ante-orbital breadth, 7.3; greatest cranial breadth, 10.0; entire maxillary tooth-row (including incisors), 10.1; entire mandibular tooth-row (including incisors), 9.3 mm.

SPECIMENS EXAMINED.—Five, including two from the type locality.

\* *Ante*, p. 177.

† For measurements of another adult female see *ibid.*, p. 195.

REMARKS.—Both size and colour differentiate this animal from the other Peninsular races; in dimensions it closely approaches *U. weberi*. Jentink,\* from Western Sumatra, of which it may eventually prove to be the Malayan representative.

RATUFA AFFINIS JOHORENSIS, *subsp. nov.*

*Ratufa affinis typica*, Bonhote (nec *Sclater*), "Ann. Mag. Nat. Hist." (7), v. p. 495 (1900).

*Ratufa affinis johorensis*, "Trouessart. Cat. Mamm.," p. 308, No. 3,018*a* (1904) (*nomen nudum*).

*Ratufa affinis (sub. lege)*, "Miller, Proc. Acad. Sci. Washington," ii, p. 77 (1900).

TYPE.—Adult female (skin and skull), No. 1090/11, Selangor Museum. Collected at Padang Tuan, Segamat, N. W. Johore, 25th February, 1911, by Museum Collector.

CHARACTERS.—Intermediate between *Ratufa affinis affinis* (Raffles.), from Singapore Island, and *Ratufa affinis aureiventris* (Geoffr.), from the territory of Malacca. From the former it differs in having the hands the feet concolorous with the rest of the limbs and in the reduction of the dark area on the cheeks and ears and from the latter in having the belly pure white, sharply differentiated from the sides.

COLOUR.—Bleached pelage. Above pale cream, head darker and more buffy, the hairs without any visible annulations. Muzzle, a patch beneath and in front of the ears, whitish. A narrow ring round the eye seal-brown. Ears pale seal-brown on their outer aspect, more or less ochraceous on the inner side. Limbs from the shoulders and thighs ochraceous-buff, hardly paler on the hands and feet. A stripe of paler ochraceous-buff from the shoulder to the thigh, interrupted by a not very conspicuous white patch on the outer aspect of the thigh. Tail whitish-brown above, beneath with the proximal half of the hairs whitish, the tips mingled brownish and buffy. Midrib whitish-brown, beneath pure white quite sharply defined from the sides.

MEASUREMENTS.—Collector's external measurements taken in the flesh: head and body, 300; tail, 405; hind-foot (without claws) 70; ear 25 mm. Skull: greatest length,—; basilar length,—; zygomatic breadth, 41.5; greatest length of nasals, 21.8; diastema, 14.9; cranial breadth, 31.1; interorbital breadth, 26.3; upper molar series, 13.3 mm.

REMARKS.—Mr. Miller has already (*loc. cit. supra*) remarked that the Johore pale *Ratufa* would probably prove distinct from that of Singapore, while Prof. Trouessart has applied a name, without description, which we have adopted. Besides the type we have seen other specimens from the Sembrong River further south in Johore, but these were in bad condition and without skulls or measurements.

\* In Weber's "Zool. Ergebn. Reis. Niederland Ost-Indie," 1, p. 124 (1890).

RATUFA MELANOPEPLA PENANGENSIS, *subsp. nov.*

TYPE.—Adult male (skin and skull), No. 1348 11, Selangor Museum. Collected at Telok Bahang, Penang Island, by E. Semund, on 11th March, 1911.

CHARACTERS.—Similar to *R. m. fretensis*,\* Thos. and Wrought, in colour but smaller in size, greatest length of skull never exceeding 70 mm. Size about equal to *R. m. tiomanensis*,† Miller, but abdomen much brighter.

COLOUR.—Upper-surface, and entire tail with the exception of a narrow ochraceous streak at the base of under-surface, black; below, rich tawny ochraceous, this colour extending on the outer side of the neck to the ears and over the front of the fore-limb. No trace of a pale nuchal spot. A small tawny ochraceous patch on the inner side of the hind-foot.

MEASUREMENTS.—Collector's external measurements taken in the flesh: head and body, 322; tail, 372; hind-foot, 76; ear, 30 mm.

Cranial measurements: greatest length, 68.3; condylo-basilar length, 57.1; palatilar length, 25.3; diastema, 14.0; upper molar series, 14.2; interorbital breadth, 27.2; zygomatic breadth, 42.2; greatest length of nasals, 22.2 mm.

SPECIMENS EXAMINED.—Twenty, all from the type locality.

REMARKS.—The patch on the hind-foot is very variable, sometimes taking the form of a slight grizzling only, but it is present in almost every specimen examined.

MUS MUELLERI FEDERIS, *subsp. nov.*

TYPE.—Adult female (skin and skull), No. 1853 11, Selangor Museum. Collected at Ulu Temengoh, Upper Perak, Federated Malay States, by H. C. Robinson and C. B. Kloss on the 12th July, 1909. Original No. 2917.

CHARACTERS.—A member of the *Muelleri* group agreeing with *Mus validus*, Miller, in its large teeth, shape of the parietals and in the posterior terminations of the nasals but differing in smaller size; with relatively larger feet and slightly more inflated bullae. From *Mus bullatus*,‡ Lyons, it is at once separated by its very much smaller bullae, very large teeth, and pentagonal parietals.

COLOUR.—Above grizzled brown and buff, becoming greyer on the sides and darker on the rump owing to the presence of numerous long black bristles. Lower-surface buffy white, the hairs with faint grey bases. Hands and feet very thinly clad, the former brownish the latter white with dark centres. Tail blackish brown throughout.

\* "Annals and Magazine of Natural History," ser. 8, vol. iv, p. 545 (1869).

† "Proceedings of the Washington Academy of Sciences," vol. ii, p. 216 (1900).

‡ Lyon, "Proc. U. S. Nat. Mus.," xxxiv, p. 645 (1908), 14th s. popular, 1909. *Mus villosus*, Kloss, "Journ., Federated Malay States Museum," 11, p. 149 (1st October, 1909).

**SKULL AND TEETH.**—Skull fairly lightly built not heavily ridged. Nasals narrowing to a point posteriorly and extending beyond the premaxillary suture. Bullæ somewhat dilated, more so than in *M. validus*, but not approaching those of *M. annandalii* and *M. bullatus* or those of the *rattus* group. Teeth large, larger than those of the much larger animal, *Mus validus*.

**MEASUREMENTS.**—Collector's external measurements taken in the flesh: head and body, 182 (236);\* tail, 239 (280); hind-foot, 45 (45.5); ear, 21 (23) mm.

Cranial measurements: greatest length, 48 (53.7); basilar length, 37.9 (44.7); palatilar length, 22.5 (24.4); breadth between anterior molars, 4.0 (4.8); length of palatal foramina, 8.1 (8.3); diastema, 12.2 (14.2); length of upper molar row, 10.0 (9.6); median length of nasals, 18.6 (22.7); greatest breadth of combined nasals, 5.6 (5.9); interorbital breadth, 7.0 (8.2); cranial breadth, 18.5 (20.0); zygomatic breadth, 22.5 (26.9).

**SPECIMENS EXAMINED.**—Two, the type and a sub-adult female from Ginting Bidei, Selangor (Selangor Museum, No. 1798/09).

**REMARKS.**—This rat is evidently the peninsular representative of the Sumatran *Mus muelleri*, Jentink, the type of which is stated by Miller † to be a immature animal lacking the posterior portion of the skull so that no actual comparison is possible. The dimensions given being those of a mounted specimen can also only be regarded as very approximate.

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## ON A HORNED OWL, NEW TO THE MALAY PENINSULA.

By HERBERT C. ROBINSON, C.M.Z.S., M.B.O.U.

BUBO COROMANDUS. KLOSSII, *subsp. nov.*

A LOCAL race of *Bubo coromandus* from Peninsular India but very much darker than the typical form.

**ADULT MALE.**—Above dull brown, head, ear-coverts and mantle slightly darker; the nape and outer webs of the secondaries vermiculated with whitish brown, the former with dark shaft stripes. The under-surface throughout vermiculated with dark brown and whitish-brown and with broad blackish-brown shaft stripes. Feathers of the thighs, under wing-coverts and under tail-coverts similar but more buff. Iris yellow, bill greenish-horn with black base, feet leaden. Total length, 21.5; wing, 15.7; tail, 8.7; tarsus, 2.55; bill from gape, 1.55 inch.

**TYPE.**—Adult male, Gunong Semanggol, North Perak, Malay Peninsula, collected on 22nd May, 1910, by E. Seimund.

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\* Measurements in parentheses those of an adult female, *Mus validus* (Selangor Museum, No. 1854/11) from Maxwell's Hill, Taiping, Perak.

† "Proc. U. S. Nat. Mus." xxxiv, p. 647 (1909).